

MEMORANDUM

TO: Water Right File 63-34714

FROM: Daniel Nelson – Analyst 3

DATE: November 4, 2019

SUBJECT: Licensing Review of Water Right 63-34714

The field exam for this right was performed by Certified Field Examiner Terry Scanlan of SPF Water Engineering.

History and Overlap Analysis:

It is important on these two right to review the history and the overlapping water rights for these two ponds. In the field report Mr. Scanlan didn't include any overlapping water rights, but I found that water rights 63-9751 and 63-9718 clearly uses both ponds associated with these two permits. Due to the complex nature of these two ponds, it was necessary to do a complete overlap analysis of the two overlapping water rights. Each water right will be addressed separately.

Water Right 63-9751 Analysis:

Water right 63-9751 was originally filled to provide water from the Boise River to Village Lake and through an aesthetic feature in Riverside Village homeowner's Association (RVHOA).

A memorandum by David Shaw dated May 22, 1981 stated that he inspected Village Lake during the digging of the lake and determined that the lake was filled with ground water and not Boise River water. I have included a copy of Mr. Shaw's memo as an attachment to this analysis.

A water right license was issued that allowed for aesthetic use authorizing flow through water through Village Lake and several ponds in the RVHOA from the Boise River.

Water Right transfer 69237, the Boise River water filling Village Lake was transferred to provide additional flow through water to additional aesthetic ponds for RVHOA. Water Right Water Right 63-9751 was included in a second transfer (transfer number 78263) as associated water right, but water right 63-7951 was not altered in the transfer.

Water Right 63-9718 Analysis:

Water right 63-9718 was licensed for irrigation and aesthetic storage uses from Village Lake. This probably should have been called ground water at this time, because the Village Lake is not a natural water body, and water right 63-7951 authorizes diversion of Boise River water through Village Lake. The field examination states that water was only being diverted from irrigation out of Village Lake at the time of the field examination. Long Lake was shown as another point of diversion in the field examination maps, but there was no discussion concerning this diversion from Long Lake in the field report. Long Lake was also included in the adjudication claim, but wasn't included in the decree, because it wasn't included in the license.

In December of 2011, RVHOA filed an application for transfer numbered 77710, which as subsequently renumbered to 78263. Transfer 78263 added the point of diversion from Long Lake. According to the transfer, Long Lake and Village Lake receive Boise River water directly from the river through diversion structures, pipelines existing ditches, waterways or channels. Please see the attached application for transfer map attached to this email and review the supplemental information in the transfer that states the following about Long Lake:

The Association's requested additional point of diversion is from an existing pump situated within an artifact side channel of the Boise River locally known as Long Lake. The Association has an agreement with Garden City allowing the Association's access to, and use of, this pump. The Association believes Long Lake has a direct hydraulic connection with the Boise River, and Long Lake receives Boise River water directly via a diversion structure and pipeline from the Boise River. Any water diverted by the Association for irrigation from Long Lake is proposed to be measured and regulated by the Water District 63 Watermaster at the Long Lake Pump.

The naming of these two lakes in the transfer is slightly different than the names you used for these two lakes in the field report, but it is obvious they are the same two lakes described in these two permit.

It is clear from the documentation in the overlapping documents, that Boise River water is being diverted directly into both Village Lake and Long Lake. However, Mr. Shaw's May 22, 1981, memorandum clearly determines that when developed, Village Lake was actually being fed by shallow ground water coming from the opposite side of the Lake than the Boise River. Due to the close proximity of these two ponds and the similar pond depths that both of these ponds are filled with ground water.

As stated above, source of Village Lake on water right 63-9718 should be ground water tributary to the Boise River, and the point of diversion for the Boise River diversion should have been placed where the water from the Boise River enters Long Lake. Unfortunately, I am unable to change these files without another water right transfer being filed on water rights 63-9718 and 63-9751. Designating the source of water on these permits as ground water tributary to the Boise River is correct.

Pond Storage:

I feel that the majority of Mr. Scanlan's field report was satisfactory. Mr. Scanlan did an excellent job of determining the pond depth and the area of the pond of 31.5 af. I am concerned about the evaporation calculations that Mr. Scanlan used.

It appears as though Mr. Scanlan used the Turf Grass analysis for the pond evaporation instead of the pond evaporation rate. However, Mr. Scanlan's calculations matches the "Open Water – Shallow Systems (Ponds and Streams)" dataset instead. The "Turf Grass" dataset has 9.7 af of evapotranspiration for the 3 acres. The "Open Water – Shallow Systems (Ponds and Streams)" dataset gives them 6.8 af of evaporation for the 3 acres. I typically use the "Open Water – Small Stock Ponds" dataset instead, which would have been closer to the "Turf Grass" with a total of 8.2 af for 3 acres.

Regardless, the evaporation rate authorized by the permit was 6.8 af for the 3 acres of surface area for the pond, and it appears as though the evaporation recommended by Mr. Scanlan is acceptable.

Mitigation:

The mitigation use for this permit was based on the 1 for 1 model that is rarely used any longer. Actual evaporation and evapotranspiration rates are more accurate methods of calculating the mitigation needed. It does appear as though the same process recommended by Mr. Scanlan was the same method approved in the application for permit process. During the evaluation process, there was a concern about the 60% holdback, which is done to account for the percentage of cuts due to the Stewart Decree. During this process it was determined that 60% holdback would not be needed, and I agree with the reasoning agreeing to not including the 60% holdback for this permit.

In order for the mitigation plan to be in force, the 3 acres and the associated diversion rate was to be removed from the water right used for mitigation. The right used for mitigation is 63-30130. The 3 acres would also need to be removed from all of the associated rights for this permit. The base right has not been reduced, so the mitigation has not been accomplished. However, this appears to be a Department error, since the permit holder did not make these changes. In order to remedy this situation, we will need to hear what Nick Miller wants to do.

Conditions:

Condition 26A will be removed at licensing. Condition 121 will be changed to condition 103 as is standard. The remaining conditions should be carried forward to licensing. Condition 930 has a water bearing zone of 0 to 15 feet. The actual depth of the pond according to Mr. Scanlan is 18 feet. A change in water bearing zone from 15 feet to 18 feet should not cause any difference in the water zone. Therefore, I feel we can update this condition without requiring an amendment to adjust the condition.

RECEIVED

M E M O R A N D U M

MAY 27 1981

Department of Water Resources

TO: FILE 63-9718
Riverside Village Association

FROM: David Shaw DBS

SUBJECT: Source of Water

DATE: May 22, 1981

This application lists the source of water as Village Lake, which is adjacent to the Boise River but does not have a surface connection between the river and the lake. I inspected this lake at the time it was excavated and believe the primary source of water for the lake is groundwater, rather than surface flow from the Boise River infiltrating to the lake. During the excavation, the lake was kept empty by pumping and it seemed the primary inflow to the lake was not from shallow infiltration from the river. In fact, a large portion of the inflow came from the side of the lake opposite the river.

For the ^{non}consumptive use requested to irrigate the levees, I believe the groundwater inflow to the lake is adequate. The larger flow proposed is for aesthetics and will be non-consumptive for water amenities through the development.

DBS:h1h

MICROFILMED



2011 NAIP Photography

Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	63-34714
REVIEWER	Dan Nelson
DATE	11/4/2019

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:

P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at X:/Spatial/Climate/ETIdahostations.shp.

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any negative precipitation deficit values.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Turf Grass (Lawns) Irrigated

Precipitation Deficit

Station: **Boise WSFO Airport (NWS -- USC00101022)**

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.03	31	0.00
Feb	0.08	28	2.24
March	0.62	31	19.22
April	3.07	30	92.10
May	4.40	31	136.40
June	5.91	30	177.30
July	6.49	31	201.19
August	5.50	31	170.50
September	3.87	30	116.10
October	2.21	31	68.51
November	-0.09	30	0.00
December	-0.23	31	0.00

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

Total mm/year = **983.56**

[(mm/yr) ÷ (convert to feet)] X (Surface area of pond, in acres) = Evaporation Loss in Acre Feet

$$\left(\frac{983.56}{304.8} \right) \times 3.00 = 9.7 \text{ AFA}$$



University of Idaho

Kimberly Research
and Extension Center

Water Resources Program

ETIdaho 2017

Evapotranspiration and Consumptive
Irrigation Water Requirements
for Idaho

Please send suggestions for
improving this site to robison at
uidaho dot edu

2019-11-04 15:14

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Idaho.*

Boise WSFO Airport (NWS -- USC00101022)

Statistics based on thirty year normal spans 1986 to 2016 years

For a different land cover or crop click on the above link.

You can highlight this table and copy via the clipboard to a Microsoft Excel or OpenOffice spreadsheet to plot or otherwise work with this data.

Grass - Turf (lawns) - Irrigated Precipitation Deficit (Click here for a graph)															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b	Annual
Mean ^j	mm/day												mm		
Monthly ^c	-0.03	0.08	0.62	3.07	4.40	5.91	6.49	5.50	3.87	2.21	-0.09	-0.23	987	-13	974
15-Day Moving Average ^d	-0.06	0.03	0.62	3.08	4.43	5.89	6.53	5.50	3.81	2.26	-0.13	-0.23			
7-Day Moving Average ^e	-0.04	0.05	0.61	3.05	4.39	5.90	6.51	5.49	3.82	2.23	-0.13	-0.25			
3-Day Moving Average ^f	-0.03	0.07	0.62	3.07	4.38	5.90	6.49	5.49	3.84	2.21	-0.09	-0.23			

Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	65-23168
REVIEWER	Mary Condon
DATE	8/17/2018

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:

P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at X:/Spatial/Climate/ETIdahostations.shp.

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any negative precipitation deficit values.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Open Water -shallow systems (ponds and Streams)

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.62	31	0.00
Feb	0.11	28	3.08
March	0.83	31	25.73
April	2.07	30	62.10
May	2.76	31	85.56
June	4.12	30	123.60
July	4.68	31	145.08
August	3.95	31	122.45
September	2.65	30	79.50
October	1.41	31	43.71
November	-0.21	30	0.00
December	-0.78	31	0.00

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

Total mm/year = 690.81

$$[(690.81 \text{ mm/yr}) \div (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$$

$$(690.81 \div 304.8) \times 3.00 = 6.8 \text{ AFA}$$



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Kimberly Research
and Extension Center

[Water Resources Program](#)

ETIdaho 2017

Evapotranspiration and Consumptive
Irrigation Water Requirements
for Idaho

Please send suggestions for
improving this site to robison at
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2019-11-04 15:31

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Idaho.*

Boise WSFO Airport (NWS -- USC00101022)

Statistics based on thirty year normal spans 1986 to 2016 years

For a different land cover or crop click on the above link.

You can highlight this table and copy via the clipboard to a Microsoft Excel or OpenOffice spreadsheet to plot or otherwise work with this data.

Open water - shallow systems (ponds/streams)															
Precipitation Deficit (Click here for a graph)															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Growing Season ^a	Non Growing Season ^b	Annual
Mean ⁱ	mm/day												mm		
Monthly ^c	-0.62	0.11	0.83	2.07	2.76	4.12	4.68	3.95	2.65	1.41	-0.21	-0.78	642	0	642
15-Day Moving Average ^d	-0.66	-0.05	0.84	2.06	2.81	4.11	4.70	3.95	2.60	1.44	-0.20	-0.72			
7-Day Moving Average ^e	-0.64	0.01	0.83	2.03	2.77	4.12	4.68	3.94	2.61	1.42	-0.21	-0.76			
3-Day Moving Average ^f	-0.62	0.08	0.82	2.05	2.75	4.12	4.68	3.95	2.63	1.40	-0.19	-0.78			

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED

OCT 15 2019

DEPARTMENT OF
WATER RESOURCES

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 63-347141. Owner City of Garden City Phone No. 208-472-2949Current address City Hall, 6015 Glenwood St., Garden City, ID 83714-13472. Examiner's name Terry Scanlan, P.E., P.G., CWRE 129 EXAM DATE October 10, 2019

3. Accompanied by _____ Email _____

Address _____

Relationship to permit holder _____ Phone No. _____

4. Source Ground Water tributary to Boise River**B. OVERLAP REVIEW**1. Other water rights with the same place of use City municipal rights, n/a2. Other water rights with the same source and point of diversion None**C. DIVERSION AND DELIVERY SYSTEM**

1. Point(s) of Diversion:

Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
			NE	NE	25	4N	1E	Ada	2017 aerial photo, BUFE

2. Place(s) of Use: Method of determination 2017 aerial photo, BUFE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
4N	1E	24															J		
		25		J															

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.

Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (**required**)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size

*Code to correspond with no. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date

2. **Measurements:** _____
 Volume determined by taking soundings of pond depths and by using GIS determination of pond surface area. Pond depth ranged from 0 to 15.7 feet at 27 locations. As shown on the contour map included in Attachment B, total volume was calculated at 32 af.

E. NARRATIVE/REMARKS/COMMENTS

The exam found an excavated pond with a 3.0 acres surface area and volume of approximately 32 acre feet.

The parameters of the permit allow licensing 24.8 af for pond storage (18 af) and evaporative losses (6.8 af).

Seepage loss is not a factor since the pond naturally fills with shallow ground water. Evaporation from 3.0 acres of pond surface is 6.8 af.

The pond, locally known as Glenwood Lake or Riverside Pond, provides an aesthetic amenity to the citizens of Garden City.

Pond level will fluctuate with shallow groundwater level, which in turn is influenced by river level. Therefore, pond storage will be less when river is at low flow and greater when river is at high flow.

Water-bearing zone appropriated is from 0 to 15 feet.

Attachment A: permit record, proof of beneficial use

Attachment B: topographical map, 2017 aerial photo map, contour map

Attachment C: exam photos

Attachment D: evaporation calculations

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements? ☐ Yes ☒ No If no, what must be done to meet the permit requirements?

Pond capacity (32 af) exceeds 18 af storage volume listed on condition of approval. Permit holder can seek a new permit for the additional 14 af of volume. No mitigation would be required for the additional volume because evaporation loss from the full surface area is covered under the mitigation for this permit.

Pond depth is slightly greater than 0 to 15 feet water bearing zone. To account for water level fluctuations, a water-bearing zone of 0 to 18 feet is recommended.

F. FLOW CALCULATIONS☐ Additional computation sheets attached

Measured Method:

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

 $V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$ _____ $V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 =$ _____ $V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$ _____

2. Volume Calculations for Other Uses:

Permit pond volume: 3 acres surface area x 15 feet depth x 0.4 for sloped sides + 6.8 af evaporative loss = 24.8 af

Developed pond volume: 3 acres surface area x ~10.5 feet average depth + 6.8 evaporative loss = 38.8 af

Recommend licensing for total permit volume of 24.8 af consisting of 6.8 af for evaporation loss and 18 af for storage volume

H. RECOMMENDATIONS

1. Recommended Amounts

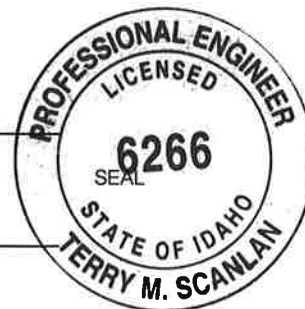
Beneficial Use	Period of Use		Rate of Diversion	Annual Volume
	From	To	Q (cfs)	V (afa)
Aesthetic Storage	1/1	12/31		24.8 af
Totals:				24.8 af

2. Recommended Amendments

☐ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☒ None☐ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☐ Other**I. AUTHENTICATION**Field Examiner's Signature Terry M. ScanlanDate 10/10/2019

Reviewer _____

Date _____





Attachment A
Permit Record, Proof of Beneficial Use

State of Idaho
Department of Water Resources
Permit to Appropriate Water
No. 63-34714

Priority: April 15, 2019

Maximum Diversion Volume: 24.8 AF

This is to certify that

CITY OF GARDEN CITY CITY HALL 6015 GLENWOOD ST GARDEN CITY ID 83714-1347

has applied for a permit to appropriate water from:

Source : GROUND WATER

Tributary: BOISE RIVER

and a permit is APPROVED for development of water as follows:

Beneficial Use

AESTHETIC STORAGE

Period of Use

01/01 to 12/31

Annual Volume

24.8 AF

Location of Point(s) of Diversion

GROUND WATER NW¼ NE¼, Sec. 25, Twp 04N, Rge 01E, B.M. ADA County

Place of Use: AESTHETIC STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
04N	01E	24																	
04N	01E	25		X													X		

Conditions of Approval

1. Proof of application of water to beneficial use shall be submitted on or before **September 1, 2024**.
2. Subject to all prior water rights.
3. This right authorizes the total annual storage volume of 24.8 acre-feet, 18.0 acre-feet to be used for the initial filling or carryover storage of the pond and 6.8 acre-feet for the replacement of losses caused by evaporation.
4. The one pond established by the storage of water under this right shall not exceed a total capacity of 18.0 acre-feet or a total surface area of 3.0 acres.
5. Water bearing zone to be appropriated is 0 to 15 feet.
6. To mitigate for the depletion of water resulting from the use of water under this right and to prevent injury to senior water right holders, the right holder shall cease diverting and using water as authorized by the following water rights for the purposes and amounts specified below. Moreover, the official record for the following water right will be changed to show that diversion and use of water is not authorized because the rights, or portion thereof, are being dedicated to mitigation by non-use. The mitigating right may also include a condition stating that the mitigation by non-use is for the benefit of this right.

Right No.	Use Changed to Mitigation	Mitigation Mitigation by Non-Use	Mitigation Rate (cfs)	Mitigation Acres
63-30130	Irrigation		0.06	3.0

The land that will no longer be irrigated under this right is located within the authorized boundary of

State of Idaho
Department of Water Resources
Permit to Appropriate Water
No. 63-34714

Thurman Mill Ditch Company.

If the specified mitigation right, or portion thereof, is sold, transferred, leased, used on any place of use, or is not deliverable due to a shortage of water or a priority call, then the amount of water authorized for diversion under this right approval shall be reduced by the same proportion as the reduction to the mitigation rights.

7. Water stored under this right is subject to fluctuations of the water table caused by changes in the flow of local streams and by diversions under prior ground water rights. This right does not guarantee the maintenance of any particular ground water level.
8. Project construction shall commence within one year from the date of permit issuance and shall proceed diligently to completion unless it can be shown to the satisfaction of the Director of the Department of Water Resources that delays were due to circumstances over which the permit holder had no control.
9. The Director retains jurisdiction to require the right holder to provide purchased or leased natural flow or stored water to offset depletion of Lower Snake River flows if needed for salmon migration purposes. The amount of water required to be released into the Snake River or a tributary, if needed for this purpose, will be determined by the Director based upon the reduction in flow caused by the use of water pursuant to this permit.

This permit is issued pursuant to the provisions of Idaho Code § 42-204.

Signed this 21st day of August, 2019.


NICK MILLER

Manager, IDWR Western Region

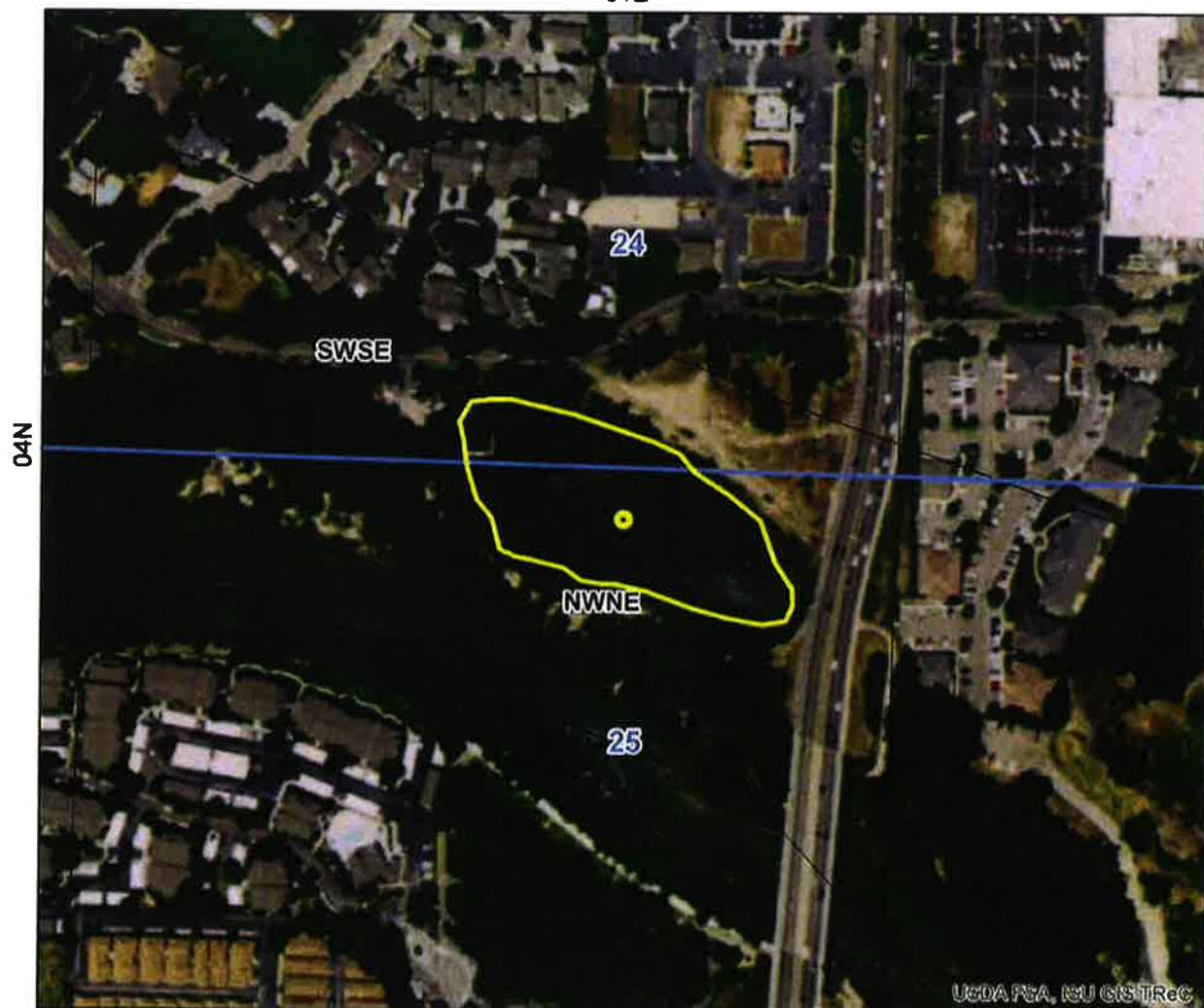
State of Idaho
Department of Water Resources

Attachment to Permit to Appropriate Water

63-34714

This map depicts the AESTHETIC STORAGE place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.

01E

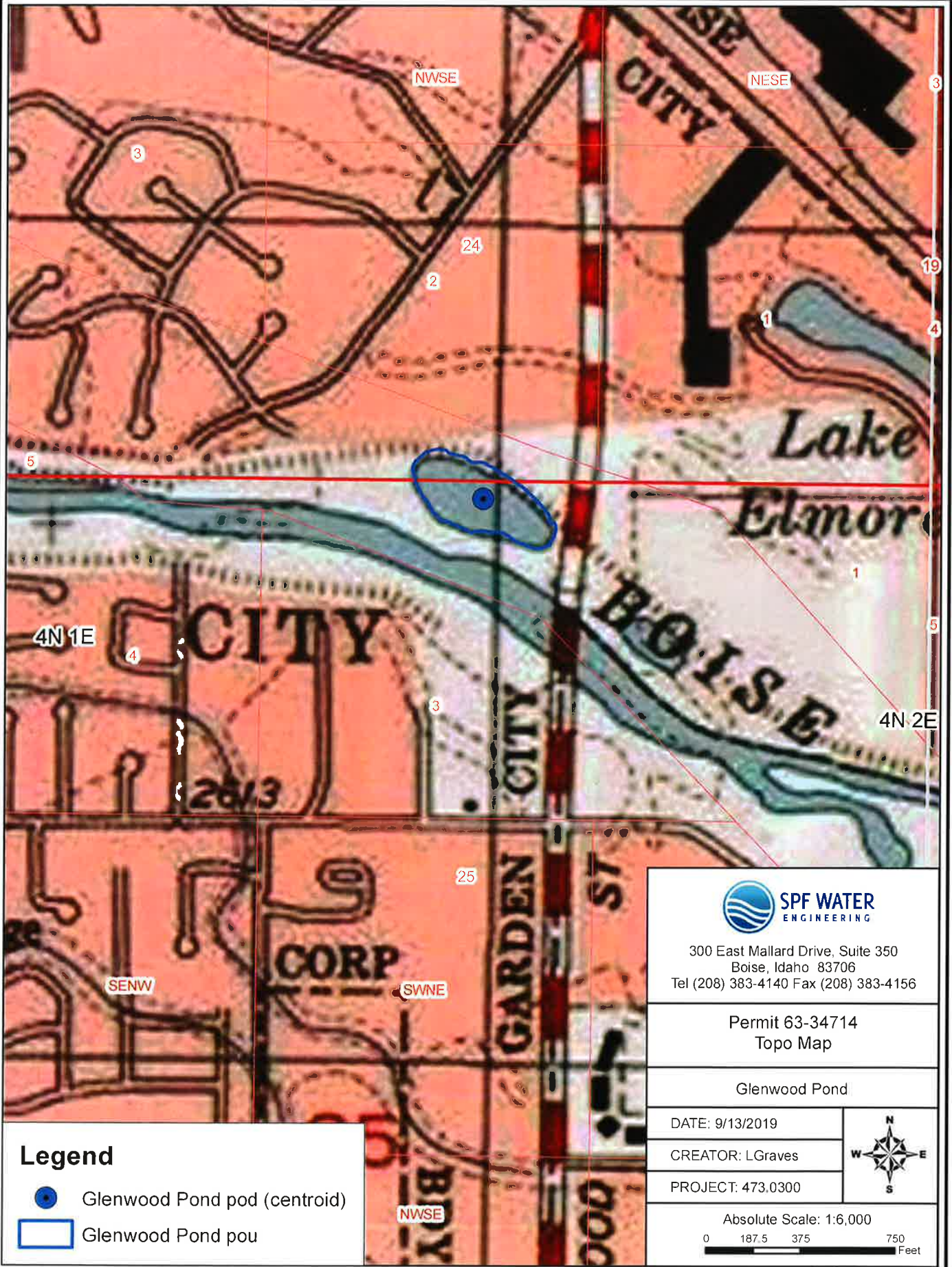


-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.035 0.07 0.14 Miles



Attachment B
Topographical Map, 2017 Aerial Photo Map, Contour
Map





Legend

- Glenwood Pond pod (centroid)
- Glenwood Pond pou



300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

Permit 63-34714
2017 Aerial Photo Map

Glenwood Pond

DATE: 9/13/2019

CREATOR: LGraves

PROJECT: 473.0300

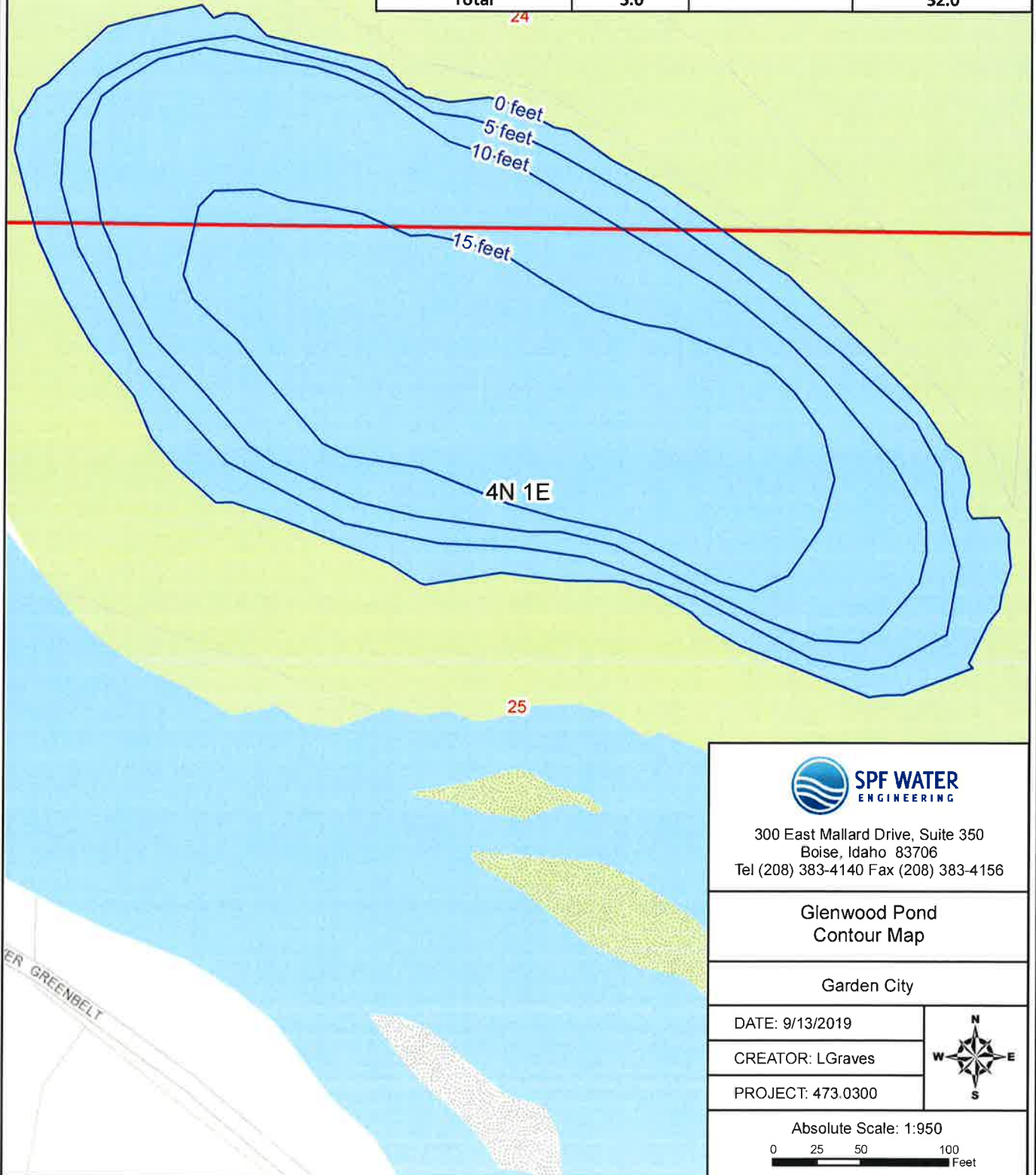


Absolute Scale: 1:6,000

0 187.5 375 750 Feet

Glenwood Pond Volume Calculation			
Contour Interval	Area	Average Depth	Volume
feet	acres	feet	acre-feet
0-5	0.6	2.5	1.5
5-10	0.4	7.5	3.0
10-15	1.0	12.5	12.5
15+	1.0	15	15.0
Total	3.0		32.0

W RIVERSIDE DR



300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

Glenwood Pond Contour Map

Garden City

DATE: 9/13/2019

CREATOR: LGraves

PROJECT: 473.0300



Absolute Scale: 1:950

0 25 50 100
Feet

Attachment C
Exam Photos



Glenwood Lake (aka Riverside Pond) looking southeast – photo date 10/10/19





Glenwood Lake – View looking northwest – photo date 10/10/19



Glenwood Lake – View looking northeast – photo date 10/10/19

Attachment D
Evaporation Calculations

Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	63-34714
REVIEWER	Lori Graves
DATE	9/12/2019

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at X:/Spatial/Climate/ETIdahostations.shp.

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any negative precipitation deficit values.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Precip Deficit (Grass-Turf)

Station: Boise WSFO Airport(NWS --US00101022)

Month	mm/day ¹	Days per month	mm/Month
Jan	-0.62	31	0.00
Feb	0.11	28	3.08
March	0.83	31	25.73
April	2.07	30	62.10
May	2.76	31	85.56
June	4.12	30	123.60
July	4.68	31	145.08
Aug	3.95	31	122.45
Sept	2.65	30	79.50
October	1.41	31	43.71
November	-0.21	30	0.00
December	-0.78	31	0.00

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

Total mm/year = 690.81

46.79

$[(\text{mm/yr}) \div (\text{convert to feet})] \times (\text{Surface area of pond, in acres}) = \text{Evaporation Loss in Acre Feet}$

$$\left(\frac{690.81}{304.8} \right) \times 3.00 = 6.8 \text{ AFA}$$